

Republic of Lebanon
National Council for Scientific Research

Provisional Seismological Bulletin

from the

NATIONAL SEISMIC NETWORK

October

2010

Prepared by
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GENERAL BULLETIN INFORMATION

The National Centre for Geophysical Research is a governmental agency established 1975 in Lebanon by the National Council for Scientific Research (CNRS). The mission of the Centre, among other assignments, is the monitoring of seismic activity within the national territory. Currently, the national seismic network is under deployment; it has been officially registered as GRAL, an acronym for Geophysical Research Arrays of Lebanon. Station coordinates and status are given below.

Since 1993, the Centre has been participating in a regional initiative by the UNESCO and the USGS known as RELEMR, i.e. Reducing Earthquake Losses in the Eastern Mediterranean Region.

Within this framework, the Centre routinely contributes to the database set up for this purpose and maintained by the Euro-Mediterranean Seismological Centre (EMSC). For coherence, the Centre has adopted the recommended seismic analysis system SEISAN developed by Jens Havskov and Lars Ottemoller from the University of Bergen, Norway.

The localization program currently used for locating earthquakes is Hypocenter (Lienert et al., 1986). Plane parallel layers are assumed for local and regional events, while the IASPEI travel time tables are used for distant events.

The velocity model used for all local and regional events is the one currently adopted by the RELEMR initiative.

P-wave velocity (km/sec)	depth to top of layer (km)
6.2	0.0
6.8	14.0
8.05	34.0
8.25	50.0
8.5	80.0

Magnitudes are calculated from the coda duration. The coda wave magnitude is estimated via the formula:

$$M_c = 0.08 + 1.63 * \log_{10}(T) + 0.0009 * D.$$

where T is the coda duration (sec) and D is the epicentral distance (km). The coefficients above were adopted at the outset of our Centre in 1980 and thus are still in use for the sake of continuity.

All available coda values are used for magnitude calculations. No station corrections are used for either travel times or magnitudes calculations. The V_p/V_s velocity ratio used in both layered models above is 1.74.

As a general policy, neither depths, nor epicenters, are fixed unless stated otherwise since this might restrict later use of the data. Consequently, some event locations might be unrealistic such as zero depth earthquakes or teleseismic locations off by 1000 km. However, the locations are based on the available data and reflect the localization procedure and the models used.

STATIONS USED

The stations listed below are operated by the National Centre for Geophysical Research. They constitute the basic setup of the National Seismic Network of Lebanon.

However, readings from other cooperating agencies are also used in locating the events and thus more stations may appear in the event lists than in the station list; it is worth mentioning the systematic use of arrival times from the Cypriot seismic network CSS in order to constrain events corresponding to an active zone off the Lebanese shorelines.

STATION	LATITUDE	LONGITUDE	HEIGHT (m)	NAME	COMMENTS
BHL	3354.25N	3539.25E	1000	BHANNES	Opened May 1980
HWQ	3416.68N	3556.78E	1161	HAWQA	Opened Jan 2001
MATL	3329.32N	3519.78E	5	MATARIH	Opened Nov 2000
FKH	3414.69N	3624.61E	1152	FAKEHEH	Opened Dec 2004
RCY	3329.79N	3550.14E	1370	RACHAYA	Opened Jun 2006
DWR	3323.13N	3524.08E	420	DWEIR	Scheduled 2003
BEYL	3352.30N	3529.59E	49	BEIRUT	Opened Jul 2006
NAQL	3307.02N	3508.46E	83	NAQOURA	Opened Jul 2008
DQRL	3342.34N	3534.21E	963	DEIR QAMAR	Opened Mar 2010

REGIONAL AND DISTANT EARTHQUAKES

Because regional events and teleseisms are not localized, but simply identified, EMSC determination data are given along with phase arrivals (in general first arrival) at the stations of our network.

MACROSEISMIC DATA

Macroseismic data, if available, are included in the bulletin.

MONTHLY EPICENTER MAPS

Maps will be found on the last page.

ELECTRONIC PUBLICATION

This provisional bulletin is available for download in pdf format on:
<http://www.cnrs.edu.lb/grdownload.html>

REFERENCES

- Havskov, J. and Ottemoller, L.(2001). SEISAN: The Earthquake Analysis Software. -version 7.2-
Institute of Solid Earth Physics, University of Bergen.
<http://www.ifjf.uib.no/seismo/software/seisan.html>
- Lienert, B.R., Berg, E. and Frazer, L.N.(1986). Hypocenter: An earthquake location method using centered, scaled, and adaptively least squares. Bull. Seism. Soc. Am., 76., pp 771-783.

Abbreviations:

TIME: Origin time in UTC (hr. min. and sec.) or data file onset time if event is not located.

LAT: Latitude of epicenter

LON: Longitude of epicenter

DEPTH: Focal depth in kilometer (trailing F indicates fixed depth)

AGENCY: REL throughout the bulletin, aka. REsearch Lebanon

MAGNITUDES: Up to 3 different magnitudes can be given followed by type and reporting agency, e.g. 3.1 MC REL - coda magnitude calculated according to above mentioned formula.

EMSC: Euro-Mediterranean Seismological Centre.

OT: Origin Time

RMS: Root mean square value of travel time residuals

STAT: Station code

CO: Component; S:short period, L:long period, B:broadband.

DIST: Epicenter distance (km)

AZI: Azimuth from source to station

PHAS: Phase; The first letter characterizes onset E(mergent) or I(mpulsive)

P: Polarity (C for compression, D for dilatation)

HR: Hour

MN: Minute

SECON: Seconds

TRES: Residual (seconds)

CODA: Signal duration in seconds

AMPL: Ground Amplitude ($0.5 * (\text{peak to peak})$), (nm) at period PERI

PERI: Period where amplitude is measured

BAZ: Back azimuth (station to event)

ARES: Back azimuth residual

VELO: Apparent phase velocity (km/sec)

WT: Weight of phase in the location

*: An asterisk before the phase arrival time implies a potential timing error. If an S phase is read, differential S-P times will be used in the hypocenter location.

October 1 2010 Hour: 3:26 3.9 Lat: 33.75N Lon: 35.54E Depth: 18 Agency: REL Local
Magnitudes: 2.6MC REL Rms: 0.0 secs

BEIRUT REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	20	31	EP		326	8.35	0.00	33						1.0
RCY	SZ	39	136	EP		326	10.82	0.02							1.0
RCY	SE	39	136	ES		326	15.89	-0.01							1.0
HWQ	BZ	70	32	EP		326	15.18	-0.02							1.0
HWQ	BN	70	32	ES		326	23.55	0.01							1.0

October 1 2010 Hour: 12:15 0.0 Agency: REL Regional

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	BZ			EP		1215	58.86								
RCY	SZ			EP		1216	3.06								

October 1 2010 Hour: 13:48 0.0 Agency: REL Regional

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
RCY	SZ			EP		1348	28.01								
HWQ	BZ			EP		1348	25.79								

October 1 2010 Hour: 15:11 27.6 Lat: 33.78N Lon: 35.78E Depth: 0 Agency: REL Local
Magnitudes: 2.8MC REL Rms: 0.0 secs

BEIRUT REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	18	320	EP		1511	30.48	-0.07	46						1.0
BHL	BN	18	320	ES		1511	32.76	0.04							1.0
DQRL	SZ	21	248	EP		1511	31.08	0.07							1.0
DQRL	SN	21	248	ES		1511	33.48	-0.04							1.0
RCY	SZ	32	171	EP		1511	32.72	0.00							1.0
HWQ	BZ	58	15	EP		1511	36.88	0.00							1.0

October 3 2010 Hour: 9:13 19.6 Lat: 33.53N Lon: 36.04E Depth: 0 Agency: REL Local
Magnitudes: 2.6MC REL Rms: 0.0 secs

MOUNT HERMON REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
RCY	SZ	19	257	EP		913	22.62	-0.03	33						1.0
DQRL	SZ	47	294	EP		913	27.24	0.06							1.0
DQRL	SN	47	294	ES		913	32.81	0.00							1.0
BHL	BZ	54	319	EP		913	28.27	-0.02							1.0
BHL	BN	54	319	ES		913	34.75	-0.01							1.0
HWQ	BZ	83	354	EP		913	32.92	0.00							1.0

October 3 2010 Hour: 10:42 54.9 Lat: 33.79N Lon: 35.77E Depth: 4 Agency: REL Local
Magnitudes: 2.7MC REL Rms: 0.0 secs

BEIRUT REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	17	321	EP		1042	57.64	-0.04	41						1.0
DQRL	SZ	20	243	EP		1042	58.30	0.04							1.0
DQRL	SN	20	243	ES		1043	0.77	0.00							1.0
RCY	SZ	33	169	EP		1043	0.18	-0.08							1.0
RCY	SN	33	169	ES		1043	4.29	0.04							1.0
HWQ	BZ	57	17	EP		1043	4.12	0.04							1.0

October 3 2010 Hour: 15:21 1.9 Agency: REL Regional

EMSC OT=15:21:01.9 34.93N 26.45E 40Km mb=5.0 CRETE, GREECE

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
DQRL	SZ			EP		1522	48.71								
BHL	BZ			EP		1522	49.51								
HWQ	BZ			EP		1522	51.63								
RCY	SZ			EP		1522	51.87								
FKH	SZ			EP		1522	56.68								

October 4 2010 Hour: 0:4 5.5 Lat: 33.78N Lon: 35.67E Depth: 19 Agency: REL Local
Magnitudes: 2.8MC REL Rms: 0.1 secs

BEIRUT REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	14	355	EP		0 4	9.46	0.14	43						1.0
BHL	BE	14	355	ES		0 4	12.09	-0.08							1.0
RCY	SZ	35	154	EP		0 4	11.73	-0.14							1.0
RCY	SN	35	154	ES		0 4	16.69	0.08							1.0
HWQ	BZ	61	25	EP		0 4	15.50	0.00							1.0

October 4 2010 Hour: 13:28 35.7 Agency: REL Distant

EMSC OT=13:28:35.7 24.35N 125.32E 10Km Mw=6.4 RYUKYU ISL.

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	BZ			EP		1340	24.53								
BHL	BZ			EP		1340	25.32								
RCY	SZ			EP		1340	26.84								

October 5 2010 Hour: 22:4 21.3 Lat: 34.03N Lon: 35.77E Depth: 19 Agency: REL Local
Magnitudes: 2.9MC REL Rms: 0.0 secs

KESROUANE

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	17	218	EP		22 4	25.50	0.03	49						1.0
HWQ	BZ	33	30	EP		22 4	27.38	0.05							1.0
HWQ	BE	33	30	ES		22 4	31.79	-0.04							1.0
DQRL	SZ	40	207	EP		22 4	28.24	-0.05							1.0
RCY	SZ	59	174	EP		22 4	31.05	0.01							1.0
RCY	SN	59	174	ES		22 4	38.27	0.00							1.0

October 7 2010 Hour: 10:41 30.6 Lat: 34.37N Lon: 36.75E Depth: 2 Agency: REL Local
Magnitudes: 2.8MC REL Rms: 0.1 secs

NEBEK REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ	34	246	EP		1041	36.05	-0.15	47						1.0
HWQ	BZ	75	262	EP		1041	42.75	0.03							1.0
HWQ	BN	75	262	ES		1041	51.69	0.04							1.0
RCY	SZ	129	221	EP		1041	51.51	0.14							1.0
RCY	SN	129	221	ES		1042	6.66	-0.05							1.0
DQRL	SZ	132	236	EP		1041	51.72	-0.07							0.2

October 8 2010 Hour: 2:43 44.6 Lat: 34.06N Lon: 35.68E Depth: 24 Agency: REL Local
Magnitudes: 3.0MC REL Rms: 0.1 secs

KESROUANE

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	18	187	EP		243	49.35	-0.09							1.0
HWQ	BZ	34	46	EP		243	51.22	-0.01							1.0
HWQ	BN	34	46	ES		243	56.14	0.03							1.0
DQRL	SZ	41	194	EP		243	52.06	-0.04	57						1.0
DQRL	SN	41	194	ES		243	57.73	0.09							1.0
RCY	SZ	65	167	EP		243	55.46	0.07							1.0
RCY	SN	65	167	ES		244	3.29	-0.06							1.0

October 8 2010 Hour: 3:26 13.9 Agency: REL Distant

EMSC OT=03:26:13.9 51.47N 175.35W 20Km mb=6.4 ANDREANOF ISLANDS

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ			EP		339	12.83								
HWQ	BZ			EP		339	12.98								
BHL	BZ			EP		339	14.96								
DQRL	SZ			EP		339	16.02								

October 8 2010 Hour: 3:49 11.1 Agency: REL Distant
EMSC OT=03:49:11.1 51.50N 175.24W 30Km Mw=6.1 ANDREANOF ISLANDS
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 HWQ BZ EP 4 2 8.37
 FKH SZ EP 4 2 8.76
 BHL BZ EP 4 2 10.68
 DQRL SZ EP 4 2 12.00

October 8 2010 Hour: 12: 8 32.6 Lat: 33.78N Lon: 35.78E Depth: 0 Agency: REL Local
Magnitudes: 2.7MC REL Rms: 0.0 secs
BEIRUT REGION
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 BHL BZ 18 320 EP 12 8 35.37-0.06 37 1.0
 BHL BE 18 320 ES 12 8 37.56 0.02 1.0
 DQRL SZ 21 246 EP 12 8 35.98 0.02 1.0
 RCY SZ 32 170 EP 12 8 37.79 0.01 1.0
 RCY SN 32 170 ES 12 8 41.63-0.01 1.0
 HWQ BZ 57 16 EP 12 8 41.82 0.02 1.0

October 9 2010 Hour: 8:30 46.2 Lat: 34.41N Lon: 36.83E Depth: 0 Agency: REL Local
Magnitudes: 3.1MC REL Rms: 0.1 secs
NEBEK REGION
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 FKH SZ 43 245 EP 830 53.06 0.00 63 1.0
 FKH SE 43 245 ES 830 58.18 0.03 1.0
 HWQ BZ 83 260 EP 830 59.54 0.05 1.0
 BHL BZ 122 243 EP 831 5.62-0.23 1.0
 RCY SZ 137 223 EP 831 8.22 0.00 1.0
 DQRL SZ 140 237 EP 831 8.85 0.17 1.0
 DQRL SN 140 237 ES 831 25.32-0.01 1.0

October 10 2010 Hour: 11:24 2.3 Lat: 34.40N Lon: 36.81E Depth: 0 Agency: REL Local
Magnitudes: 2.9MC REL Rms: 0.1 secs
NEBEK REGION
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 FKH SZ 41 245 EP 1124 8.76-0.15 48 1.0
 FKH SN 41 245 ES 1124 13.77 0.00 1.0
 HWQ BZ 81 261 EP 1124 15.37 0.01 1.0
 HWQ BN 81 261 ES 1124 24.99 0.00 1.0
 BHL BZ 120 243 EP 1124 21.85 0.15 1.0
 DQRL SZ 138 236 EP 1124 24.50-0.01 1.0

October 11 2010 Hour: 8:34 32.8 Lat: 33.66N Lon: 35.86E Depth: 13 Agency: REL Local
Magnitudes: 2.4MC REL Rms: 0.0 secs
CENTRAL BEKAA
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 RCY SZ 18 188 EP 834 36.44-0.06 25 1.0
 RCY SN 18 188 ES 834 39.33 0.05 1.0
 DQRL SZ 28 281 EP 834 37.74 0.01 1.0
 BHL BZ 33 325 EP 834 38.50-0.07 1.0
 BHL BN 33 325 ES 834 42.90 0.03 1.0
 HWQ BZ 69 7 EP 834 44.01 0.04 1.0

October 11 2010 Hour: 10:50 0.0 Agency: REL Local
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 HWQ BZ EP 1050 59.10
 FKH SZ EP 1050 52.32

October 12 2010 Hour: 3:55 0.0

Agency: REL Regional

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	BZ			EP		355	44.76								

October 12 2010 Hour: 14: 8 31.9

Lat: 33.90N Lon: 35.79E Depth: 11 Agency: REL Local

Magnitudes: 2.4MC REL

Rms: 0.0 secs

KESROUANE

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	12	270	EP		14	8	34.74	0.00		27				1.0
BHL	BN	12	270	ES		14	8	36.87	0.00						1.0
DQRL	SZ	30	223	EP		14	8	37.11	-0.01						1.0
HWQ	BZ	44	19	EP		14	8	39.25	0.00						1.0
RCY	SZ	46	174	EP		14	8	39.52	0.02						1.0
RCY	SN	46	174	ES		14	8	45.14	-0.01						1.0

October 12 2010 Hour: 14:36 47.5

Lat: 34.64N Lon: 36.38E Depth: 0 Agency: REL Local

Magnitudes: 2.9MC REL

Rms: 0.1 secs

HERMEL BAALBEK REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ	44	177	EP		1436	54.41	-0.09	52						1.0
FKH	SE	44	177	ES		1436	59.75	0.05							1.0
HWQ	BZ	57	225	EP		1436	56.70	0.09							1.0
HWQ	BN	57	225	ES		1437	3.32	-0.05							1.0
DQRL	SZ	128	216	EP		1437	8.08	0.00							1.0
DQRL	SN	128	216	ES		1437	23.32	0.00							1.0

October 12 2010 Hour: 15:47 22.8

Lat: 33.79N Lon: 35.78E Depth: 0 Agency: REL Local

Magnitudes: 2.7MC REL

Rms: 0.0 secs

BEIRUT REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	18	318	EP		1547	25.66	-0.02	42						1.0
BHL	BN	18	318	ES		1547	27.78	0.01							1.0
DQRL	SZ	22	245	EP		1547	26.34	0.00							1.0
RCY	SZ	33	171	EP		1547	28.16	0.03							1.0
RCY	SN	33	171	ES		1547	32.03	-0.01							1.0
HWQ	BZ	56	16	EP		1547	31.95	0.00							1.0

October 13 2010 Hour: 10:19 0.0

Agency: REL Local

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ			EP		1019	33.97								
HWQ	BZ			EP		1019	40.75								

October 13 2010 Hour: 12:30 20.5

Lat: 33.76N Lon: 35.97E Depth: 10 Agency: REL Local

Magnitudes: 2.8MC REL

Rms: 0.0 secs

CENTRAL BEKAA

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
RCY	SZ	32	204	EP		1230	26.01	0.00	44						1.0
RCY	SN	32	204	ES		1230	30.09	-0.01							1.0
BHL	BZ	34	298	EP		1230	26.13	-0.10							1.0
BHL	BN	34	298	ES		1230	30.52	0.03							1.0
DQRL	SZ	38	261	EP		1230	26.94	0.05							1.0
HWQ	BZ	57	357	EP		1230	29.97	0.03							1.0

October 14 2010 Hour: 7:42 16.0

Lat: 34.04N Lon: 35.72E Depth: 25 Agency: REL Local

Magnitudes: 2.6MC REL

Rms: 0.0 secs

KESROUANE

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	17	202	EP		742	20.82	-0.08	35						1.0
BHL	BN	17	202	ES		742	24.55	0.03							1.0
HWQ	BZ	33	38	EP		742	22.65	0.01							1.0
DQRL	SZ	40	201	EP		742	23.48	0.04							1.0
RCY	SZ	62	170	EP		742	26.38	0.00							1.0
RCY	SN	62	170	ES		742	34.06	-0.01							1.0

October 14 2010 Hour: 9: 8 24.1 Agency: REL Regional

EMSC OT=09:08:24.1 36.10N 29.61E 30Km ML=4.6 WESTERN TURKEY

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
NAQL	SZ			EP		9 9	42.71								
DQRL	SZ			EP		9 9	43.23								
HWQ	BZ			EP		9 9	43.97								
RCY	SZ			EP		9 9	47.11								

October 14 2010 Hour: 10: 7 55.5 Lat: 33.79N Lon: 35.77E Depth: 4 Agency: REL Local
Magnitudes: 2.7MC REL Rms: 0.0 secs

BEIRUT REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	17	320	EP		10 7	58.37	0.01	42						1.0
BHL	BN	17	320	ES		10 8	0.44	0.00							1.0
DQRL	SZ	21	244	EP		10 7	58.96	-0.01							1.0
RCY	SZ	33	169	EP		10 8	0.94	0.01							1.0
RCY	SN	33	169	ES		10 8	4.91	-0.01							1.0
HWQ	BZ	57	17	EP		10 8	4.70	-0.02							1.0
HWQ	BN	57	17	ES		10 8	11.52	0.01							1.0

October 14 2010 Hour: 11:43 31.7 Lat: 34.03N Lon: 35.74E Depth: 24 Agency: REL Local
Magnitudes: 2.7MC REL Rms: 0.0 secs

KESROUANE

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	16	208	EP		1143	36.41	-0.02							1.0
BHL	BN	16	208	ES		1143	39.90	0.00							1.0
HWQ	BZ	34	35	EP		1143	38.32	0.00	37						1.0
HWQ	BN	34	35	ES		1143	43.19	0.00							1.0
DQRL	SZ	39	203	EP		1143	39.01	0.02							1.0
RCY	SZ	60	171	EP		1143	41.85	0.00							1.0

October 14 2010 Hour: 12:23 25.7 Lat: 33.75N Lon: 35.89E Depth: 21 Agency: REL Local
Magnitudes: 2.8MC REL Rms: 0.0 secs

CENTRAL BEKAA

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	28	308	EP		1223	31.33	-0.04							1.0
BHL	BE	28	308	ES		1223	35.53	0.00							1.0
RCY	SZ	28	191	EP		1223	31.43	-0.03	47						1.0
RCY	SN	28	191	ES		1223	35.71	0.02							1.0
DQRL	SZ	30	261	EP		1223	31.66	0.03							1.0
HWQ	BZ	59	5	EP		1223	35.59	0.02							1.0

October 14 2010 Hour: 14:31 20.7 Lat: 33.58N Lon: 36.02E Depth: 16 Agency: REL Local
Magnitudes: 2.9MC REL Rms: 0.1 secs

CENTRAL BEKAA

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
RCY	SZ	20	240	EP		1431	24.86	-0.06	51						1.0
RCY	SN	20	240	ES		1431	28.07	0.04							1.0
DQRL	SZ	44	288	EP		1431	28.25	0.08							1.0
BHL	BZ	49	317	EP		1431	28.85	-0.09							1.0
BHL	BN	49	317	ES		1431	35.02	-0.01							1.0
HWQ	BZ	77	355	EP		1431	33.16	0.06							1.0

October 17 2010 Hour: 3: 1 57.6 Lat: 33.74N Lon: 35.71E Depth: 0 Agency: REL Local
Magnitudes: 3.0MC REL Rms: 0.0 secs

BEIRUT REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
DQRL	SZ	14	256	EP		3 1	59.81	-0.05							1.0
DQRL	SN	14	256	ES		3 2	1.52	0.02							1.0
BHL	BZ	19	343	EP		3 2	0.69	-0.08	59						1.0
BEYL	BZ	25	306	EP		3 2	1.80	0.08							1.0
HWQ	BZ	64	20	EP		3 2	7.90	-0.02							1.0
HWQ	BE	64	20	ES		3 2	15.55	0.01							1.0

FKH SZ 86 49 EP 3 2 11.47 0.04 1.0

October 17 2010 Hour: 8:59 42.1 Lat: 33.66N Lon: 35.87E Depth: 15 Agency: REL Local
Magnitudes: 2.7MC REL Rms: 0.1 secs

CENTRAL BEKAA

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
RCY	SZ	19	190	EP		859	45.97	-0.09	39						1.0
RCY	SN	19	190	ES		859	49.06	0.05							1.0
DQRL	SZ	28	280	EP		859	47.34	0.09							1.0
DQRL	SN	28	280	ES		859	51.07	-0.02							1.0
BHL	BZ	33	323	EP		859	47.92	-0.07							1.0
HWQ	BZ	69	6	EP		859	53.20	0.05							1.0

October 17 2010 Hour: 10:10 0.0 Agency: REL Local

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	BZ			EP		1011	14.52								
RCY	SZ			EP		1011	14.61								

October 20 2010 Hour: 15:42 9.2 Agency: REL Regional

EMSC OT=15:42:09.2 35.22N 32.91E 53Km ML=3.5 CYPRUS REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	BZ			EP		1542	50.01								
DQRL	SZ			EP		1542	49.91								

October 21 2010 Hour: 8:34 0.0 Agency: REL Local

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	BZ			EP	D	835	26.36								
FKH	SZ			EP		835	19.18								

October 21 2010 Hour: 14: 8 55.1 Lat: 33.75N Lon: 35.87E Depth: 8 Agency: REL Local
Magnitudes: 2.7MC REL Rms: 0.1 secs

CENTRAL BEKAA

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	26	311	EP		14 8	59.45	-0.06	37						1.0
DQRL	SZ	28	259	EP		14 8	59.89	0.06							1.0
DQRL	SN	28	259	ES		14 9	3.33	-0.01							1.0
RCY	SZ	29	186	EP		14 8	59.86	-0.08							1.0
RCY	SN	29	186	ES		14 9	3.57	0.04							1.0
HWQ	BZ	59	7	EP		14 9	4.72	0.04							1.0

October 21 2010 Hour: 14:20 47.0 Lat: 34.01N Lon: 35.53E Depth: 1 Agency: REL Local
Magnitudes: 2.6MC REL Rms: 0.0 secs

OFFSHORE CENTRAL LEBANON

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	16	135	EP		1420	49.61	-0.07	36						1.0
BHL	BN	16	135	ES		1420	51.69	0.02							1.0
DQRL	SZ	34	174	EP		1420	52.48	0.01							1.0
DQRL	SN	34	174	ES		1420	56.56	0.02							1.0
HWQ	BZ	49	52	EP		1420	54.87	0.03							1.0
RCY	SZ	64	153	EP		1420	57.24	-0.01							1.0

October 21 2010 Hour: 21:55 29.9 Lat: 33.02N Lon: 35.26E Depth: 0 Agency: REL Local
Magnitudes: 2.7MC REL Rms: 0.0 secs

NORTH GALILEE

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
NAQL	SZ	15	314	EP		2155	32.20	-0.09	39						1.0
NAQL	SE	15	314	ES		2155	34.12	0.06							1.0
RCY	SZ	75	46	EP		2155	42.09	0.05							1.0
RCY	SN	75	46	ES		2155	51.03	0.00							1.0
DQRL	SZ	81	21	EP		2155	43.00	0.03							1.0
DQRL	SN	81	21	ES		2155	52.62	-0.03							1.0
BHL	BZ	104	21	EP		2155	46.72	-0.02							1.0
HWQ	BZ	153	25	EP		2155	54.36	0.01							1.0

October 22 2010 Hour: 11:38 0.0 Agency: REL Local
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 HWQ BZ EP 1138 47.32
 RCY SZ EP 1138 50.50

October 22 2010 Hour: 11:46 0.0 Agency: REL Local
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 HWQ BZ EP 1146 27.37
 RCY SZ EP 1146 30.50

October 22 2010 Hour: 12:55 2.8 Agency: REL Regional
EMSC OT=12:55:02.8 35.42N 27.50E 2Km mb=4.0 DODECANESE ISLANDS
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 HWQ BZ EP 1256 45.99
 RCY SZ EP 1256 46.56

October 22 2010 Hour: 16:11 0.0 Lat: 33.79N Lon: 35.75E Depth: 0 Agency: REL Local
Magnitudes: 2.9MC REL Rms: 0.1 secs
BEIRUT REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	16	324	EP		16	1	12.55-0.04	50						1.0
DQRL	SZ	19	242	EP		16	1	13.24	0.10						1.0
DQRL	SN	19	242	ES		16	1	15.39-0.06							1.0
BEYL	BZ	26	291	EP		16	1	14.20	0.01						1.0
RCY	SZ	33	167	EP		16	1	15.44	0.05						1.0
RCY	SN	33	167	ES		16	1	19.31-0.04							1.0
HWQ	BZ	57	18	EP		16	1	19.27	0.02						1.0
FKH	SZ	79	50	EP		16	1	22.74-0.03							1.0

October 22 2010 Hour: 21:55 22.7 Lat: 34.05N Lon: 36.83E Depth: 6 Agency: REL Local
Magnitudes: 2.7MC REL Rms: 0.1 secs
NEBEK REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ	44	299	EP		2155	29.78-0.07	41							1.0
FKH	SN	44	299	ES		2155	35.24	0.06							1.0
HWQ	BZ	85	287	EP		2155	36.46	0.04							1.0
HWQ	BN	85	287	ES		2155	46.55-0.06								1.0
BHL	BZ	110	262	EP		2155	40.41	0.11							1.0
DQRL	SZ	123	252	EP		2155	42.12-0.07								1.0

October 23 2010 Hour: 5:49 8.9 Agency: REL Regional
EMSC OT=05:49:08.9 36.44N 35.70E 2Km ML=3.1 CENTRAL TURKEY

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ			EP		549	48.38								
HWQ	BZ			EP		549	45.99								

October 23 2010 Hour: 10:15 33.0 Lat: 34.09N Lon: 35.63E Depth: 13 Agency: REL Local
Magnitudes: 2.8MC REL Rms: 0.0 secs
KESROUANE

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	21	174	EP		1015	37.13	0.00	43						1.0
BHL	BE	21	174	ES		1015	40.22	0.00							1.0
HWQ	BZ	36	55	EP		1015	39.22	0.02							1.0
HWQ	BN	36	55	ES		1015	43.80-0.02								1.0
DQRL	SZ	43	187	EP		1015	40.32-0.02								1.0
RCY	SZ	69	164	EP		1015	44.14	0.01							1.0

October 23 2010 Hour: 13: 8 34.5 Lat: 33.78N Lon: 35.76E Depth: 8 Agency: REL Local
Magnitudes: 2.6MC REL Rms: 0.0 secs

BEIRUT REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	17	325	EP		13	8	37.67-0.05	34						1.0
BHL	BN	17	325	ES		13	8	40.09	0.02						1.0
DQRL	SZ	19	246	EP		13	8	38.05	0.02						1.0
RCY	SZ	32	167	EP		13	8	39.93-0.01							1.0
RCY	SN	32	167	ES		13	8	43.93	0.00						1.0
HWQ	BZ	58	17	EP		13	8	44.07	0.02						1.0

October 24 2010 Hour: 10:19 38.9 Lat: 33.81N Lon: 36.81E Depth: 31 Agency: REL Local
Magnitudes: 3.1MC REL Rms: 0.0 secs

DAMASCUS REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ	60	322	EP		1019	49.38-0.03	66							1.0
FKH	SN	60	322	ES		1019	57.21	0.02							1.0
HWQ	BZ	95	303	EP		1019	54.00	0.01							1.0
RCY	SZ	97	249	EP		1019	54.30	0.03							1.0
RCY	SN	97	249	ES		1020	5.64-0.01								1.0
BHL	BZ	107	276	EP		1019	55.50-0.02								1.0

October 25 2010 Hour: 7:40 41.3 Agency: REL Regional

EMSC OT=07:40:41.3 34.64N 23.53E 2Km mb=4.7 CRETE, GREECE

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	BZ			EP		743	8.31								
RCY	SZ			EP		743	8.06								

October 25 2010 Hour: 12: 5 27.6 Agency: REL Distant

EMSC OT=12:05:27.6 00.03S 125.16E 27Km Mw=5.7 MOLUCCA SEA

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ			EP		1218	20.68								
HWQ	BZ			EP		1218	21.88								
RCY	SZ			EP		1218	22.70								
BHL	BZ			EP		1218	23.30								

October 25 2010 Hour: 14:14 39.4 Lat: 33.81N Lon: 35.77E Depth: 13 Agency: REL Local
Magnitudes: 2.6MC REL Rms: 0.0 secs

BEIRUT REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	15	314	EP		1414	42.76-0.01	35							1.0
BHL	BN	15	314	ES		1414	45.29	0.00							1.0
DQRL	SZ	22	239	EP		1414	43.61	0.00							1.0
RCY	SZ	35	171	EP		1414	45.48-0.02								1.0
RCY	SN	35	171	ES		1414	50.04	0.01							1.0
HWQ	BZ	55	17	EP		1414	48.44	0.01							1.0

October 25 2010 Hour: 15:15 0.8 Lat: 33.78N Lon: 35.80E Depth: 0 Agency: REL Local
Magnitudes: 2.6MC REL Rms: 0.0 secs

BEIRUT REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	19	315	EP		1515	3.82	0.01							1.0
DQRL	SZ	23	247	EP		1515	4.49	0.05							1.0
DQRL	SN	23	247	ES		1515	7.11-0.04								1.0
RCY	SZ	32	173	EP		1515	6.02	0.05	32						1.0
RCY	SN	32	173	ES		1515	9.76-0.04								1.0
HWQ	BZ	57	14	EP		1515	9.87-0.03								1.0

October 25 2010 Hour: 19:37 30.6 Agency: REL Distant
EMSC OT=19:37:30.6 02.94S 100.30E 16Km Mw=6.1 MENTAWAI REGION
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 HWQ BZ EP 1948 45.19
 RCY SZ EP 1948 46.25
 BHL BZ EP 1948 46.52
 DQRL SZ EP 1948 47.05

October 27 2010 Hour: 10:31 40.9 Lat: 33.76N Lon: 35.92E Depth: 14 Agency: REL Local
Magnitudes: 2.8MC REL Rms: 0.1 secs
CENTRAL BEKAA
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 BHL BZ 30 303 EP 1031 46.35 0.06 1.0
 RCY SZ 30 195 EP 1031 46.35-0.09 44 1.0
 RCY SN 30 195 ES 1031 50.55 0.04 1.0
 DQRL SZ 33 260 EP 1031 46.77-0.05 1.0
 HWQ BZ 58 2 EP 1031 50.56 0.16 1.0
 HWQ BN 58 2 ES 1031 57.27-0.13 1.0

October 27 2010 Hour: 15:21 2.0 Lat: 33.79N Lon: 35.77E Depth: 4 Agency: REL Local
Magnitudes: 2.8MC REL Rms: 0.0 secs
BEIRUT REGION
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 BHL BZ 17 321 EP 1521 4.79-0.07 44 1.0
 BHL BN 17 321 ES 1521 6.99 0.03 1.0
 DQRL SZ 21 244 EP 1521 5.45 0.02 1.0
 RCY SZ 33 169 EP 1521 7.37 0.00 1.0
 RCY SN 33 169 ES 1521 11.33 0.00 1.0
 HWQ BZ 57 17 EP 1521 11.26 0.02 1.0

October 27 2010 Hour: 15:48 36.5 Lat: 33.79N Lon: 35.77E Depth: 0 Agency: REL Local
Magnitudes: 3.0MC REL Rms: 0.1 secs
BEIRUT REGION
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 BHL BZ 17 320 EP 1548 39.23-0.06 59 1.0
 BHL BE 17 320 ES 1548 41.31-0.01 1.0
 DQRL SZ 21 244 EP 1548 39.88 0.00 1.0
 BEYL BZ 27 290 EP 1548 40.88-0.09 0.2
 RCY SZ 33 169 EP 1548 41.81-0.02 1.0
 RCY SN 33 169 ES 1548 45.72-0.01 1.0
 HWQ BZ 57 16 EP 1548 45.71-0.02 1.0
 FKH SZ 78 49 EP 1548 49.23 0.11 1.0
 FKH SN 78 49 ES 1548 58.37-0.05 1.0

October 28 2010 Hour: 9: 6 42.4 Lat: 33.79N Lon: 35.77E Depth: 5 Agency: REL Local
Magnitudes: 2.9MC REL Rms: 0.0 secs
BEIRUT REGION
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 BHL BZ 16 320 EP 9 6 45.24-0.02 52 1.0
 BHL BN 16 320 ES 9 6 47.40 0.01 1.0
 DQRL SZ 21 243 EP 9 6 45.88 0.00 1.0
 RCY SZ 33 169 EP 9 6 47.87 0.01 1.0
 RCY SN 33 169 ES 9 6 51.90-0.01 1.0
 HWQ BZ 57 17 EP 9 6 51.59 0.00 1.0

October 29 2010 Hour: 13:46 45.9 Agency: REL Regional
EMSC OT=13:46:45.9 37.08N 30.78E 100Km ML=4.3 WESTERN TURKEY
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 HWQ BZ EP 1347 58.96
 BHL BZ EP 1347 58.56
 DQRL SZ EP 1347 59.85
 RCY SZ EP 1348 4.75

October 31 2010 Hour: 10: 5 23.8 Lat: 33.74N Lon: 36.98E Depth: 22 Agency: REL Local
Magnitudes: 3.1MC REL Rms: 0.0 secs

DAMASCUS REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
RCY	SZ	110	256	EP		10 5	41.05	0.04	65						1.0
RCY	SN	110	256	ES		10 5	53.73	-0.01							1.0
HWQ	BZ	113	302	EP		10 5	41.42	-0.05							1.0
HWQ	BE	113	302	ES		10 5	54.59	0.04							1.0
BHL	BZ	124	279	EP		10 5	43.06	-0.07							1.0
BHL	BN	124	279	ES		10 5	57.44	0.01							1.0
DQRL	SZ	131	269	EP		10 5	44.16	0.07							1.0
DQRL	SN	131	269	ES		10 5	59.07	-0.03							1.0

Epicentral Map of Lebanon

October 2010

